

Ethnomedicinal study of the khumi indigenous community in Bandarban district, Bangladesh

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ABSTRACT

The current study documents the traditional healers' concept of ethnomedicine among the indigenous Khumi community in Bangladesh's Bandarban Hill District. A Khumi ethnomedical study was done for the first time in Bangladesh. We set out to record ethnomedicinal knowledge from both traditional healers and elder members of the community in order to collect and document all information on plant use and preserve it for future generations. We specifically sought to draw attention to brand-new ethnomedicinal plant species and their therapeutic advantages. There are 87 plant species with Khumi names in total and 67 diseases and illnesses are treated with them. These species, which come from 83 genera and 49 families, are listed alphabetically with the family, Khumi name, parts used, illness treated, preparation method and mode of use. This study demonstrated that the Khumi community still heavily relies on ethnomedicinal plants to cure a variety of maladies and disorders and that several of these plants are being employed in novel ways or for the first time in medicinal contexts.

Keywords: Ethnomedicine, Khumi, Bandarban, Bangladesh.

1. INTRODUCTION

Between botany and tribal knowledge of the therapeutic properties of plants, medico-ethno botany serves as a link. Traditional knowledge of medicinal plants and their use by indigenous cultures are helpful for community healthcare and drug development in the present and the future, in addition to helping to preserve cultural traditions and biodiversity (Sheng-Ji, 2001). However, of the estimated 350,000 plant species in the globe, only a small portion have been fully explored in terms of their pharmacological qualities through phytochemical investigation (Rates, 2001).

Khumi is a small indigenous community of Chittagong Hill Tracts. According to their physical makeup, the Khumi are of mongoloid descent. The Khumis currently residing in the Bandarban district's Thanchhi, Ruma, Roangchhari and Sadar upazila. The Khumi people live in a remote part of a hilly country, especially in the highest of the hills far from other settlements. Every day, they must struggle and travel great distances to get drinking water. They moved from Arakan in Myanmar and established down here at the end of the seventeenth century (Kamal et al., 2007).

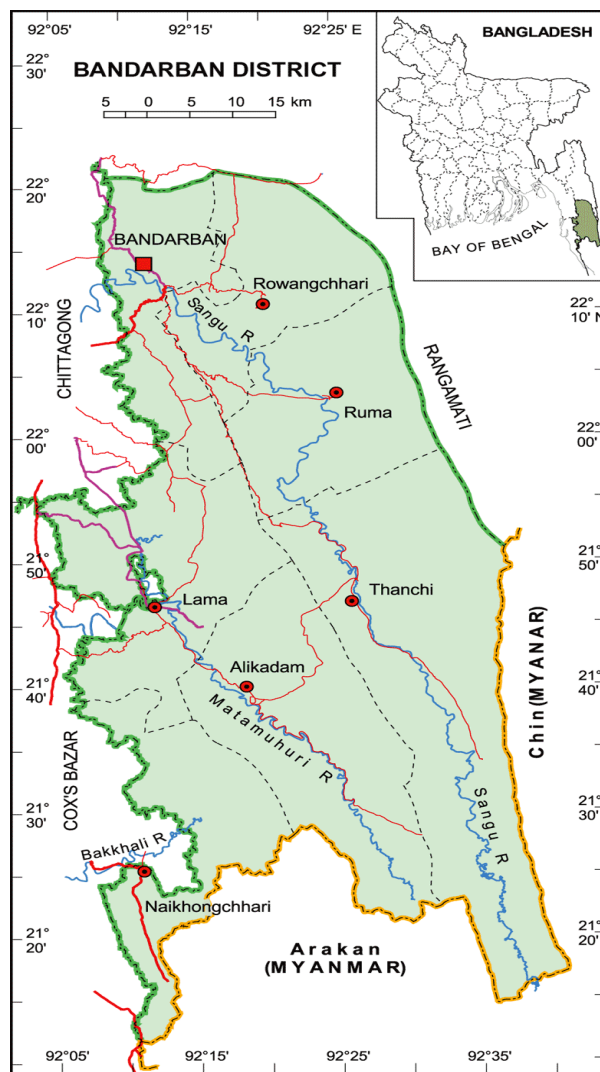


Figure 1 Map of Bandarban district, Bangladesh

The Bandarban district, one of Bangladesh's three hill districts and a portion of the erstwhile Chittagong Hill Tracts, is located in the country's extreme southeast between latitudes $21^{\circ} 11'$ and $22^{\circ} 22'$ north and longitudes $92^{\circ} 40'$ and $92^{\circ} 41'$ east. With a 4479.04 sq km area (Figure 1). It is bounded by Rangamati district in the north, Arakan (Myanmar) and the river Naf in the south, Arakan and Rangamati district in the east and Chittagong and Cox's Bazar district in the west (Shelly, 1992). It is not only the remotest district of the country, but also is the least populated (population 292,900). The three highest peak of Bangladesh-Tahjindong (1280 meters, also known as bijoy, Mowdok Mual (1052 m) and Keokradong (1230 m) are located in Bandarban district, as well as Raikhiang Lake, the highest lake in Bangladesh. The vegetation is characterized by semi-evergreen (deciduous) to tropical evergreen dominated by tall trees belonging to Dipterocarpaceae Euphorbiaceae, Lauraceae, Leguminosae and Rubiaceae.

Bangladesh has rich diversity of medicinal plants distributed in different geographical and environmental conditions. 747 species of Bangladesh's estimated 5,000 angiosperm species have been linked to therapeutic applications (Yusuf et al., 2009). Some medicinal plants from Bangladesh are using in the preparation of alternative medicine viz. Kabiraji, Hakimi, Unani, Ayurvedic, Homeopathic and as well as Allopathic systems of medicine (Kirtikar and Basu, 1935; Chopra et al., 1982). Hutchinson was one of the pioneers of ethnobotanical study in this sub-continent as well as in Bangladesh (Hutchinson, 1909). Rajput began his studies on the CHT tribes in 1965, marking the beginning of Bangladesh's ethnobotanical research. Thereafter, Sirajuddin, (1971), Saigal, (1978), Tanchangya, (1982) and shelly, (1992) worked in this line, but these are less detailed and largely dependent on Hutchinson's earlier work. Khan and Huq, (1975), Hasan and Khan, (1986), Mia and Huq, (1988), Chowdhury et al., (1989), Sarker and Hossain, (2009) worked only on medicinal aspects plant of Bangladesh.

There is some recent research on the ethnobotany of the tribal people in the CHT. Due to conflict between the tribes and Bengalis, the location, which is located in the interior of Bangladesh, has not been accessible for many years. However, this article reviews the patchy knowledge that is currently available on the plant uses by local cultures. The majority of the work was

completed after 1990. Kadir focused on Bangladeshi medicinal plants and their conservation strategy in 1990. Alam, (1992, 1998) provided documentation of Marma's ethnobotanical knowledge and use of medicinal plants. Several works also done by Hasan and Huq, (1993), Tripura, (1994), Yusuf, (1994), Hasan and Khan, (1996) on this field. Chemical analysis of some medicinal plant has done by Chowdhury et al., (1996). Alam et al., (1996), Khisa, (1996a, 1996b, 1998), Millat-e-Mustafa, (1996), Rahman and Yusuf, (1996), Rahman, (1997, 1999), Rahman and Uddin, (1998), Ghani, (1998), Uddin et al., (1998), Begum and Rashid, (1999) also worked on ethnobotanical field. All of them basically worked on the traditional plant use of tribal community as well as also the Bangali people and medicinal plant. The most recent work has done by Rahman and Wilcock, (2000, 2003), Begum et al., (2000), Millat-e-Mustafa, (2001), Khan et al., (2002), Anisuzzaman et al., (2007) and Uddin et al., (2010, 2014, 2015, 2016, 2017, 2019, 2020, 2021 and 2022).

2. METHODOLOGY

Direct observation, field interviews, plant interviews, group interviews and market surveys were used to collect the data for this study (Cotton, 1997; Rao, 1996; Alexiades, 1996). The data was recorded in the documentation data sheet during the field interview. Additionally, audio recordings have been made using a digital voice recorder to preserve historical information and document accurate facts.

The details of plant species, habits, Khumi names, availability and uses have all been documented (Table 1). Informal interviews with "baiddyas," elders and tribal leaders were undertaken over the same time period to gather ethnobotanical data. To collect information about ethnobotany, a variety of interviewing approaches have been employed according on the circumstance. Most interviewing approaches used today are semi-structured and open-ended.

Repeated field excursions were used to gather voucher specimens. Care was taken to record all pertinent taxonomic characteristics while recording the data. Professor Dr. Shaikh Bokhtear Uddin, Department of Botany, University of Chittagong, Bangladesh, was consulted for identification along with a number of literature sources. The Plants of the World Online, Kew (POWO, 2022) was used to compare the identified plant species in order to verify their correct scientific names and author citations. Every single voucher specimen was gathered during documentation and is now kept in the Chittagong University Herbarium (HCU).

Table 1 A plant species along with scientific name, khumi name, habit, family, parts used, illness treated, mode of preparation and mode of application.

s/n	Scientific Name	Khumi Name	Habit	Family	Parts used	Illness treated	Mode of preparation	Mode of application
1.	<i>Abelmoschus moschatus</i> Medik.	Taowi-akangnay	S	Malvaceae	Root, seed	tongue sore	Extract	La
2.	<i>Abroma augustum</i> (L.) L.f.	Paowi-k-achi	S	Sterculiaceae	Bark, leaf	Snake bite	Paste	La
3.	<i>Acmella paniculata</i> (Wall. ex DC.) R.K.Jansen	Athangdi	H	Asteraceae	flower	Toothache	Plant parts directly	La
4.	<i>Acorus calamus</i> L.	Langhi	H	Araceae	Leaf	Fever, headache	Paste	La
5.	<i>Aegle marmelos</i> (L.) Corrêa	By-reyei	T	Rutaceae	Fruit, leaf	Acne, epistaxis	Paste	La
6.	<i>Ageratum conyzoides</i> L.	Chettangang-acha	H	Asteraceae	Leaf, stem	Headache, black fever, leucorrhoea	Paste, juice, decoction	La, Oa
7.	<i>Allium sativum</i> L.	Mezryn-kaleywe	H	Liliaceae	Bulb	Flatulence, headache	Extract, paste	Oa, La
8.	<i>Aloe vera</i> (L.) Burm.f.	Kolatru	H	Aloeaceae	Leaf	Rheumatism, swelling, paralysis	Extract	La, Oa
9.	<i>Amomum aromaticum</i> Roxb.	Pinisomdi	H	Zingiberaceae	Rhizome	Mumps, indigestion	Paste, processed	La, Oa

							plant parts	
10.	<i>Ananas comosus</i> (L.) Merr.	Metara	H	Bromeliaceae	Leaf, fruit	Vomiting, hematuria, hook worm infestation	Extract, juice	Oa
11.	<i>Argemone mexicana</i> L.	We-kamthu-asi	H	Papaveraceae	Leaf, stem	Hydrophobia, fever, leprosy	Paste, decoction, juice	La, Oa
12.	<i>Asclepias curassavica</i> L.	Dumdi	H	Asclepiadaceae	Leaf, root	Worm, hemorrhage, piles, tuberculosis	Juice, paste, powder,	La, Oa
13.	<i>Bauhinia acuminata</i> L.	Leyei-kaowling	T	Caesalpiniaceae	Bark	Asthma	Decoction	Oa
14.	<i>Bauhinia purpurea</i> L.	Leyee-kamseng	T	Caesalpiniaceae	Bark	Hemorrhage, diarrhea	Paste, extract	La, Oa
15.	<i>Bombax ceiba</i> L.	Chapang	T	Bombacaceae	Flower, bark	Boils, dysentery	Paste, juice	La, Oa
16.	<i>Buddleja asiatica</i> Lour.	Kassey-khoyhu	S	Buddlejaceae	Leaf, root	Fever, malaria	Paste, infusion	La, Oa
17.	<i>Byttneria pilosa</i> Roxb.	Shaha	C	Sterculiaceae	Leaf, stem	Bone fracture	Paste	La
18.	<i>Callicarpa tomentosa</i> (L.) L.	Lykee	T	Verbenaceae	Root, leaf	Fever, epilepsy	Juice, extract	Oa, La
19.	<i>Calophyllum inophyllum</i> L.	Thyklui-wing	T	Clusiaceae	Seed, root	Rheumatism, snake bite	Oil, paste	La
20.	<i>Celosia argentea</i> L.	Se-ankanlingpo	H	Amaranthaceae	Leaf	Boils	Extract	La
21.	<i>Centella asiatica</i> (L.) Urb.	Ajingkrey	H	Apiaceae	Leaf, whole plant	Bronchitis, dysentery, blister, acne, chicken pox	Pills, processed plants parts	Oa
22.	<i>Hellenia speciosa</i> (J.Koenig) S.R.Dutta	Kramo-kujii	H	Costaceae	Rhizome	Cough, diabetes, fever, rash	Juice	Oa
23.	<i>Chromolaena odorata</i> (L.) R.M.King & H.Rob.	Owila	H	Asteraceae	Leaf	Bleeding, flatulence	Paste, juice	La, Oa
24.	<i>Chukrasia tabularis</i> A.Juss.	Aangtingyou	T	Meliaceae	Leaf	Gastritis	Extract	Oa
25.	<i>Cissus repanda</i> (Wight & Arn.) Vahl	Angrori	C	Vitaceae	Leaf	Jaundice	Processed plant parts	Oa
26.	<i>Citrullus lanatus</i> (Thunb.) Matsum. & Nakai	Fray	C	Cucurbitaceae	Fruit, root	Erectile dysfunction, acne, hemorrhage	Juice	Oa
27.	<i>Citrus maxima</i> (Burm.) Merr.	Dupa	T	Rutaceae	Leaf	Fever, dysentery	Pills	Oa
28.	<i>Clerodendrum infortunatum</i> L.	Arong	S	Verbenaceae	Leaf	Jaundice, scabies, anemia	Decoction	La
29.	<i>Cocos nucifera</i> L.	Kikuii	T	Arecaceae	Root	Sore throat	Infusion	Oa
30.	<i>Coix lacryma-jobi</i> L.	Kingku	H	Poaceae	Root	Gonorrhea, chicken pox	Decoction	Oa

31.	<i>Commelina diffusa</i> Burm.f.	Atdoshoichoi	H	Commelinaceae	Stem	Boils	Extract	La
32.	<i>Crassocephalum crepidioides</i> (Benth.) S.Moore	Prindey	H	Asteraceae	Whole plant	Constipation, stomach disorder	Juice	Oa
33.	<i>Cyanthillium patulum</i> (Aiton) H.Rob.	Proydoy-kamnuch	H	Asteraceae	Stem, leaf	Fever, headache	Paste	La
34.	<i>Cyathula prostrata</i> (L.) Blume	Lebbeteaowi	H	Amaranthaceae	Leaf	Cough, asthma, tongue sore	Decoction	Oa, La
35.	<i>Cymbopogon citratus</i> (DC.) Stapf	Longthing	H	Poaceae	Leaf	Asthma, cold, cough	Extract	Oa
36.	<i>Cyperus rotundus</i> L.	Aemuie-acha	H	Cyperaceae	Leaf, tuber	Headache, fever	Paste	La, Oa
37.	<i>Dalbergia volubilis</i> Roxb.	Boinneye	C	Fabaceae	Leaf	Gastritis	Juice	Oa
38.	<i>Dendrocide sinuata</i> (Blume) Chew	Aatran	S	Urticaceae	Root	Intestinal worm	Extract	Oa
39.	<i>Dendrophthoe falcata</i> (L.f.) Ettingsh.	Alikhowng	S	Loranthaceae	Leaf, stem	Body pain, rheumatism	Paste	La
40.	<i>Drimia indica</i> (Roxb.) Jessop	Owameya	H	Liliaceae	Bulb	Body burning	Extract	La
41.	<i>Embelia ribes</i> Burm.f.	Mahaka	C	Myrsinaceae	Root	Constipation	Extract	Oa
42.	<i>Euphorbia hirta</i> L.	Labeng-aaowi-asi	H	Euphorbiaceae	Leaf, stem	Breast sore, lip sore	Paste	La
43.	<i>Limonia acidissima</i> L.	Angklu	T	Rutaceae	Root	Typhoid	Extract	Oa
44.	<i>Gmelina arborea</i> Roxb. ex Sm.	Aabbey	T	Verbenaceae	Bark	Fever	Extract	Oa
45.	<i>Microcos paniculata</i> L.	Bakong	T	Tiliaceae	Leaf	Jaundice	Processed plant parts	Oa
46.	<i>Trichosanthes costata</i> Blume	Aachoroy	C	Cucurbitaceae	Root	Body pain	Paste	La
47.	<i>Heliotropium indicum</i> L.	Maha-tala	H	Boraginaceae	Flower, leaf, stem, root	Dermatitis, eczema	Powder	La, Oa
48.	<i>Helminthostachys zeylanica</i> (L.) Hook.	Asakkhu	H	Ophioglossaceae	Frond	Dysuria	Processed plant parts	Oa
49.	<i>Mesosphaerum suaveolens</i> (L.) Kuntze	Ky-sy-sheiyprang	H	Lamiaceae	Seed, root	Constipation, stomach pain	Juice	Oa
50.	<i>Jatropha gossypifolia</i> L.	Ley-abeowe	S	Euphorbiaceae	Leaf	Body pain	Paste	La
51.	<i>Justicia gendarussa</i> Burm.f.	Aawe	H	Acanthaceae	Leaf	Rheumatism, eczema	Paste	La
52.	<i>Kalanchoe pinnata</i> (Lam.) Pers.	Gang-amprony-king	H	Crassulaceae	Leaf	Asthma, bone fracture	Extract, paste	Oa, La
53.	<i>Lablab purpureus</i> (L.) Sweet	Khubi	C	Fabaceae	Leaf	Throat pain	Decoction	Oa
54.	<i>Camonea vitifolia</i> (Burm.f.) A.R.Simões & Staples	Engffeyei	C	Convolvulaceae	Leaf	Fever	Juice	Oa
55.	<i>Mesua ferrea</i> L.	Seutump	T	Clusiaceae	Root	Fever	Extract	Oa
56.	<i>Mikania micrantha</i> Kunth	Lyhu-azing	H	Asteraceae	Leaf	Hemorrhage	Paste	La
57.	<i>Mimosa pudica</i> L.	Aangze	S	Mimosaceae	Root	Piles	Extract	Oa
58.	<i>Trigastrotheca pentaphylla</i> (L.) Thulin	Somtam	H	Molluginaceae	Leaf	Asthma	Extract	Oa

59.	<i>Momordica charantia</i> L.	Achamasi	C	Cucurbitaceae	Leaf	Body pain	Processed plant parts	La
60.	<i>Nicotiana tabacum</i> L.	Sro	H	Solanaceae	Leaf	Toothache	Powder	La
61.	<i>Ocimum americanum</i> L.	Sheprang	H	Lamiaceae	Seed, leaf	Skin disease	Paste	La
62.	<i>Paederia foetida</i> L.	Clemra	C	Rubiaceae	Leaf	Indigestion	Processed plant parts	Oa
63.	<i>Piper betle</i> L.	Mra	C	Piperaceae	Leaf	Flatulence, indigestion	Plant parts directly	Oa
64.	<i>Plumeria rubra</i> L.	Lingmei-kamseng	T	Apocynaceae	Root	Menstruation problem	Extract	Oa
65.	<i>Pogostemon auricularius</i> (L.) Hassk.	Acha-kamsen	H	Lamiaceae	Leaf, flower	Fever	Paste	La
66.	<i>Premna esculenta</i> Roxb.	Angkung-gam	S	Verbenaceae	Leaf	Eczema	Paste	La
67.	<i>Psidium guajava</i> L.	Ka-i	T	Myrtaceae	Leaf	Toothache	Extract	La
68.	<i>Pueraria tuberosa</i> (Roxb. ex Willd.) DC.	Lekuie	C	Fabaceae	Stem	Hemorrhage	Extract	La
69.	<i>Rauvolfia serpentina</i> (L.) Benth. ex Kurz	Braymaraya	S	Apocynaceae	Root	High blood pressure, abdominal pain, diarrhea, dysentery	Extract	Oa
70.	<i>Ricinus communis</i> L.	Apow	S	Euphorbiaceae	Seed, leaf	Boils, swellings	Paste	La
71.	<i>Tripidium arundinaceum</i> (Retz.) Welker, Voronts. & E.A.Kellogg	Spey	H	Poaceae	Whole plant	Dysentery	Extract	Oa
72.	<i>Saccharum officinarum</i> L.	Pichchi	H	Poaceae	Stem	Jaundice	Juice	Oa
73.	<i>Senna alata</i> (L.) Roxb.	Skly-asi	S	Caesalpiniaceae	Leaf, flower	Eczema	Paste	La
74.	<i>Senna obtusifolia</i> (L.) H.S.Irwin & Barneby	Aam-aelu	H	Caesalpiniaceae	Leaf	Jaundice	Processed plant parts	Oa
75.	<i>Sida acuta</i> Burm.f.	Sikkhu	S	Malvaceae	Leaf, flower, fruit	Baldness, scabies	Paste	La
76.	<i>Smilax zeylanica</i> L.	Aawing	C	Smilacaceae	Root	Toothache, pyorrhea	Plant parts directly	Oa
77.	<i>Solanum torvum</i> Sw.	Engfy-poi	S	Solanceae	Fruit	Gastritis	Processed plant parts	Oa
78.	<i>Solanum violaceum</i> Ortega	Engfy-cha	S	Solanaceae	Root	Diarrhea	Extract	Oa
79.	<i>Spermacoce articularis</i> L.f.	Khele acha	H	Rubiaceae	Seed	Diarrhea, dysentery	Powder	Oa
80.	<i>Stephania japonica</i> (Thunb.) Miers	Ajing-kammu	C	Menispermaceae	Root	Diarrhea	Extract	Oa
81.	<i>Sterculia villosa</i> Roxb. ex Sm.	Langowi	T	Sterculiaceae	Leaf	Weakness	Infusion	Oa

82.	<i>Tamarindus indica</i> L.	Mekkesi	T	Caesalpiniaceae	Seed	Dog bite	Plant parts directly	La
83.	<i>Thunbergia grandiflora</i> Roxb.	Kaly-kholo-ajing	V	Acanthaceae	Leaf	Gout	Paste	La
84.	<i>Tinospora crispa</i> (L.) Hook.f. & Thomson	Atavei-ajing	C	Menispermaceae	Stem	High blood pressure, piles	Infusion	Oa
85.	<i>Trichosanthes tricuspidata</i> Lour.	Choim-chapray	C	Cucurbitaceae	Root	Body pain	Paste, extract	La, Oa
86.	<i>Vanda tessellata</i> (Roxb.) Hook. ex G.Don	Deli	H	Orchidaceae	Root	Rheumatism	Paste	La
87.	<i>Ziziphus jujuba</i> Mill.	Klu	T	Rhamnaceae	Bark	Diarrhea	Extract	Oa

LEGEND: H=Herb; S=Shrub; T=Tree; C=Climber; Oa=Oral administered; La=Local application.

3. RESULTS

Identification of the voucher specimens showed that 87 species in 83 genera under 50 families have been used for the treatment of 42 diseases/illness. Asteraceae in context to the number of species have been used most frequently. Similarly, other important families used for medicines are Caesalpiniaceae, Verbenaceae, Cucurbitaceae, Poaceae and Liliaceae respectively (Table 2).

Table 2 Families of the ethnomedicinal plants used by the Khumi community with their frequencies.

Family	Number of species	Family	Number of species
Asteraceae	6	Boraginaceae	1
Caesalpiniaceae	5	Bromeliaceae	1
Cucurbitaceae	4	Buddlejaceae	1
Poaceae	4	Commelinaceae	1
Verbenaceae	4	Convolvulaceae	1
Euphorbiaceae	3	Costaceae	1
Fabaceae	3	Crassulaceae	1
Lamiaceae	3	Cyperaceae	1
Rutaceae	3	Loranthaceae	1
Solanaceae	3	Meliaceae	1
Sterculiaceae	3	Mimosaceae	1
Acanthaceae	2	Molluginaceae	1
Amaranthaceae	2	Myrsinaceae	1
Apocynaceae	2	Myrtaceae	1
Clusiaceae	2	Ophioglossaceae	1
Liliaceae	2	Orchidaceae	1
Malvaceae	2	Papaveraceae	1
Menispermaceae	2	Piperaceae	1
Rubiaceae	2	Rhamnaceae	1
Aloeaceae	1	Smilacaceae	1
Apiaceae	1	Tiliaceae	1
Araceae	1	Urticaceae	1
Arecaceae	1	Vitaceae	1
Asclepiadaceae	1	Zingiberaceae	1
Bombacaceae	1		

According to life form the numbers of species have been used by them are herb 40.23% and shrub tree 20.58% 19.54% and climber 19.54% respectively (Figure 2). Of them herbs and tree are mostly used than others.

The most utilized plant parts for the preparation of herbal medicine are leaf, which is, 38.793% then root 17.241%, fruit 9.483%, seed 7.759% and whole plant 6.899% respectively (Figure 3). Stems and bark are used in a considerable amount. Bulb and latex are used occasionally. The most frequently utilization of leaves refers that they may store high concentration of bioactive compounds. In addition, it is easy to collect, store, transport and help the species in conserving without destroying the plant.

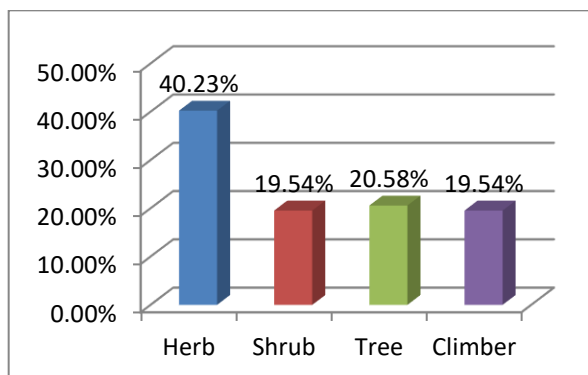


Figure 2 Showing the percentage of life form of plants used by the khumi community.

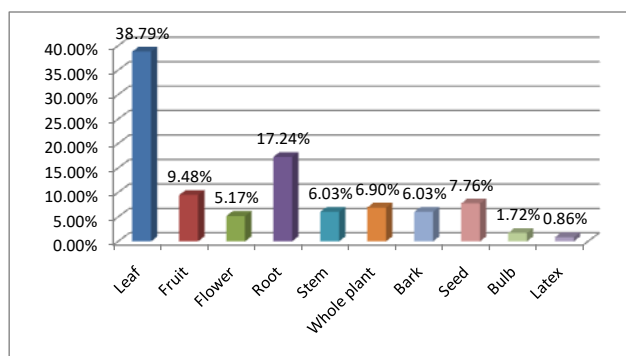


Figure 3 Showing the percentage of plant species according to their used parts.

4. DISCUSSION

The uses of the aerial part are 76% and underground parts 17% and whole plant 7%. Leaf, fruit, shoot, stem, seed, grain, flower, bark, spike, stem pith, frond, stem latex are refers to aerial parts and corm, bulb, rhizome, tuber, roots are refers to underground parts. The percentage of nondestructive plant used is 76 and destructive is 24.

By analyzing the present studied ethnomedicinal data it is observed that the Khumi are conservative in plant use and they have the knowledge of sustainable use of plants. Because they use leaves and stem most frequently for the preparation of herbal medicine which is a nondestructive way of use. The recorded medicinal plants species have been used to treat several diseases/illness of which 10 are used for the treatment of fever, 6 for different pain, 6 for hemorrhage and diarrhea, 5 for jaundice, toothache, rheumatism and so on.

The most frequently cited modes of preparation are extract, paste, juice, infusion and ointment. Syrup, powder, decoction are also used occasionally. A high proportion of treatments involve internal application and that is oral administered.

5. CONCLUSIONS

The current study demonstrated that traditional treatment methods utilizing medicinal plants are still widely used in the study area, emphasizing the significance of documenting traditional ethnomedicinal knowledge before this rich resource is lost. This is the first ethnomedicinal study in the study area, as far as we are aware. The current study identifies new ethnomedicinal species and their therapeutic applications, which may result in the creation of novel therapeutics and unique bio resources for phytochemical and pharmacological research.

Authors' contribution

All authors contributed equally for the successful completion of the research work. Shaikh Bokhtear Uddin designs the work. Data collection and processing was done by Md Salah Uddin. Vashkar Chowdhury did the final correction. Finally, all authors read and approve the final work.

Ethical approval

The study was conducted in compliance with the International Society of Ethnobiology's Code of Ethics guidelines. Each informant provided verbal informed permission prior to all interviews. Each informant was given an explanation of the research's goals and the interview process during this conversation and confidentiality was guaranteed. Additionally, permission to record audio was secured.

Acknowledgement

The authors are cordially grateful to the Khumi tribal communities inhabiting in different localities of Bandarban district because of their kind support and co-operation during the field surveys.

Informed consent

Not applicable.

Conflicts of interests

The authors declare that there are no conflicts of interests.

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All data associated with this study are present in the paper.

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